

/ Absolute Maximum Ratings(Ta=25)

Parameter		Symbol	Rating	Unit
Collector-Emitter Voltage		V_{CES}	650	V
Gate-Emitter Voltage		V_{GES}	20	V
Continuous Collector Current	$T_C=25$	I_C	80	A
	$T_C=100$		40	A
Pulsed Collector Current , Limited by T_{Jmax}		I_{CM}	160	A
Continuous Diode Forward Current	$T_C=25$	I_F	80	A
	$T_C=100$		40	A
Diode Maximum Forward Current		I_{FM}	160	A
Power Dissipation	$T_C=25$	P_D	125	W
	$T_C=100$		63	W
Operating Junction Temperature Range		T_J	-40 to +175	
Storage Temperature Range		T_{STG}	-55 to +150	
Maximum IGBT Junction-to-Case		R_{jc1}	1.64	/W
Maximum Diode Junction-to-Case		R_{jc2}	3.86	/W

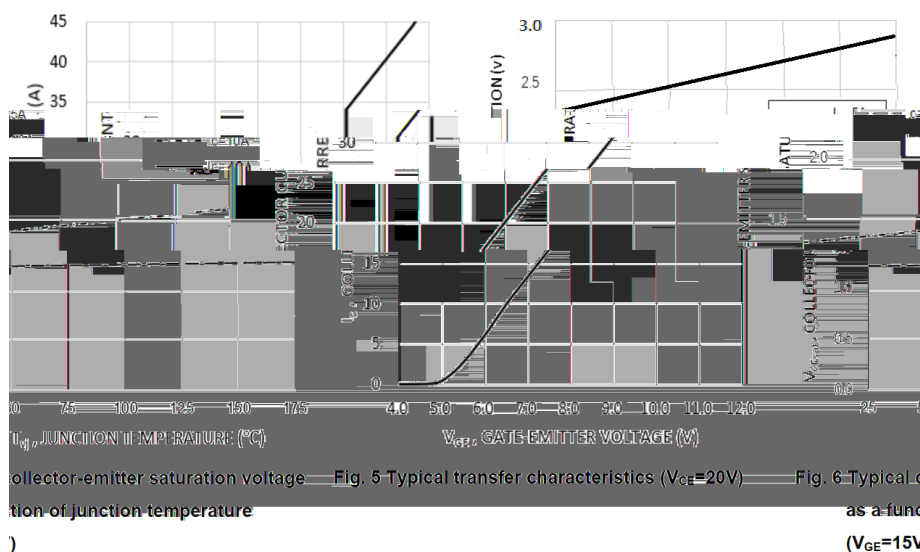
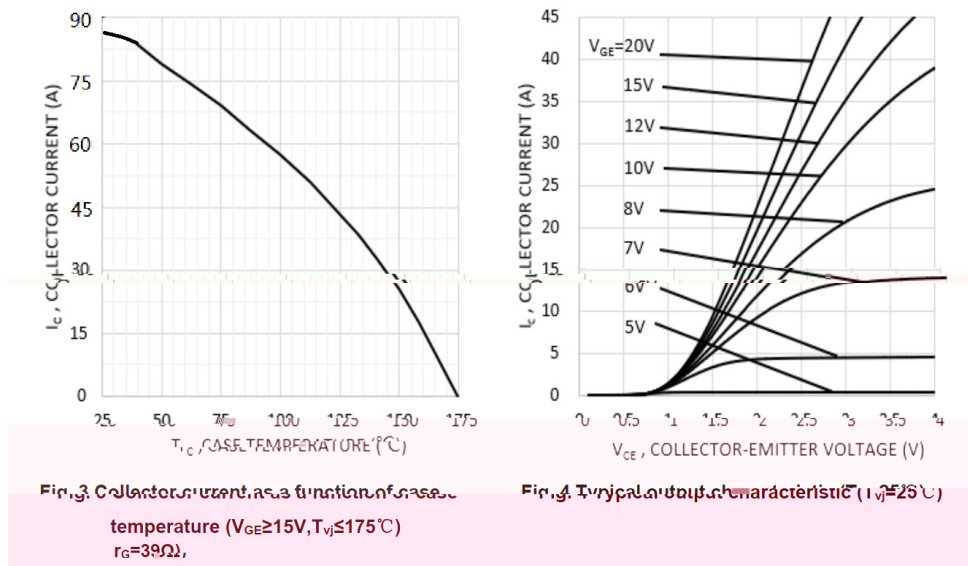
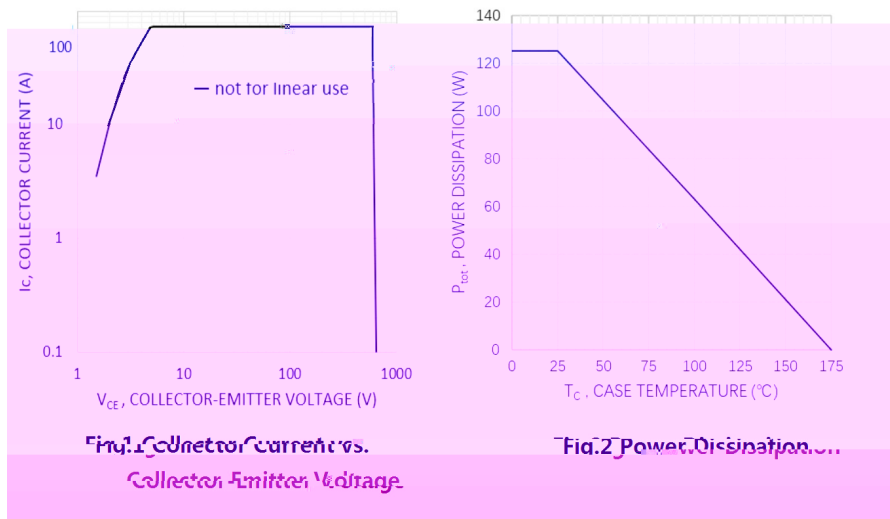
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CES}	$I_C=200\mu A, V_{GE}=0V$		650			V
Zero Gate Voltage Collector current	I_{CES}	$V_{CE}=650V, V_{GE}=0V$				40	μA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 20$				100	nA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=150 A$		4	5	6	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=40A$	$T_J=25$		2.4	2.9	V
			$T_J=125$		2.9		
Total Gate Charge	Q_g	$V_{GE}=15V, V_{CC}=520V, I_C=40A$			27		nC
Gate to Emitter Charge	Q_{ge}				6.6		
Gate to Collector Charge	Q_{gc}				9.5		

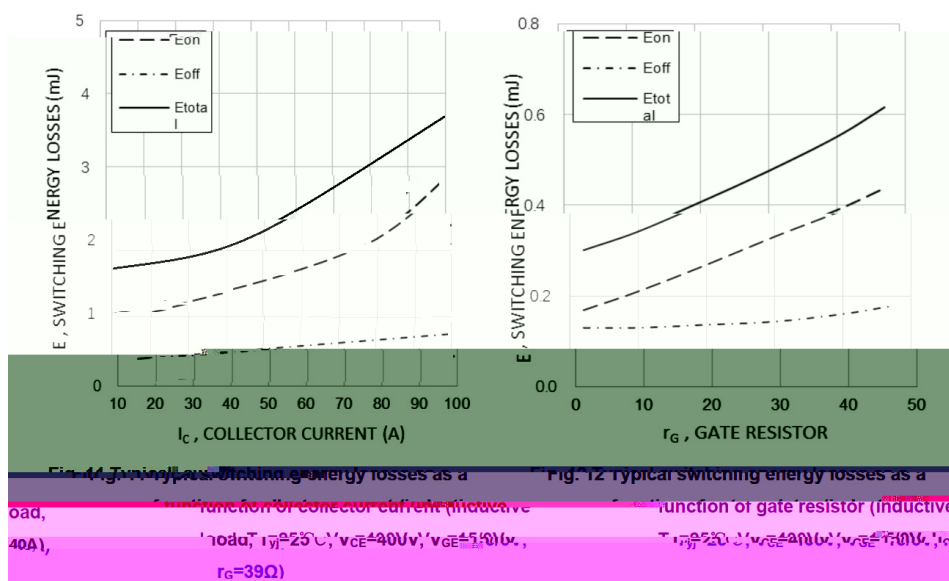
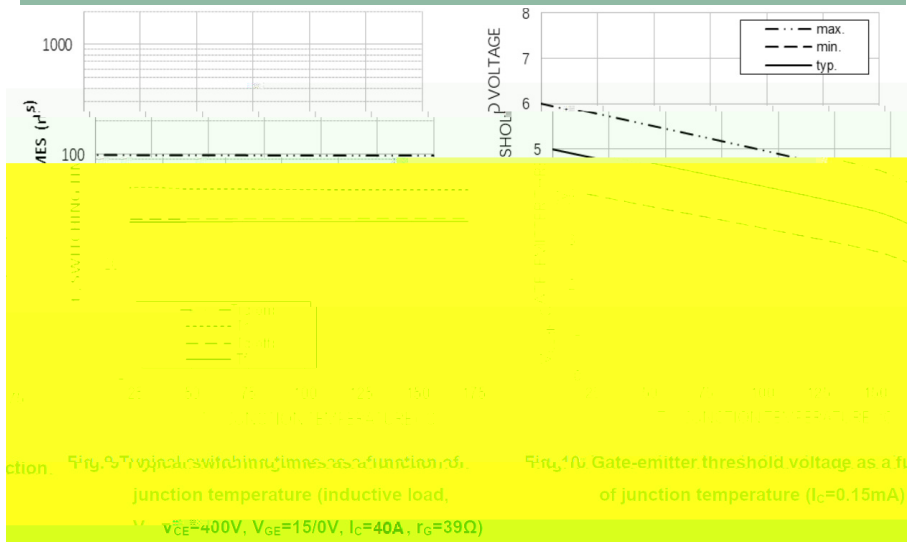
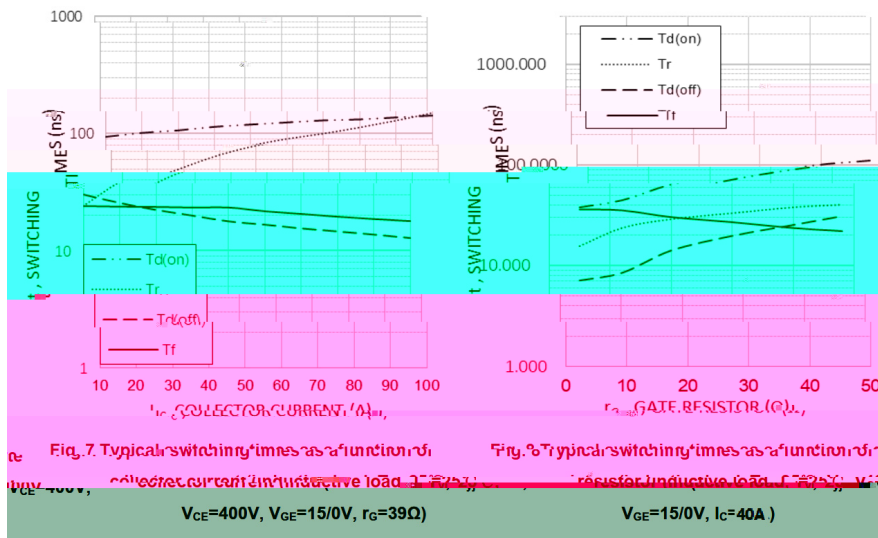
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GE}=\pm 15V$ $V_{CC}=400V$ $I_C=40A$ $R_G=39$ Inductive Load $T_C=25$			40		ns
Turn-On Rise Time	t_r				46		ns
Turn-Off Delay Time	$t_{d(off)}$				57		ns
Turn-Off Fall Time	t_f				17.5		ns
Turn-On Energy	E_{on}				1.4		mJ
Turn-Off Energy	E_{off}				0.7		mJ
Total Switching Energy	E_{ts}				2.0		mJ
Input Capacitance	C_{ies}	$V_{GE}=0V$, $V_{CE}=25V$ $f=1MHz$			1040		pF
Output Capacitance	C_{oes}				72		pF
Reverse Transfer Capacitance	C_{res}				10		pF
Short Circuit Safe Operation Area	SCSOA	$V_{GE}=15V$, $V_{CC}=400V$, $T_{J,start}=25$		6			s
Diode Forward Voltage	V_F	$I_F=40A$	$T_J=25$		1.9	2.7	V
			$T_J=150$		1.7	2.5	
Diode Reverse Recovery Time	T_{rr}	$V_R=400V$, $I_F=40A$ $dI_F/dt=300A/\mu s$ $T_C=25$			90		ns
Diode Reverse Recovery Charge	Q_{rr}				450		nC
Diode Peak Reverse Recovery Current	I_{rm}				8		A

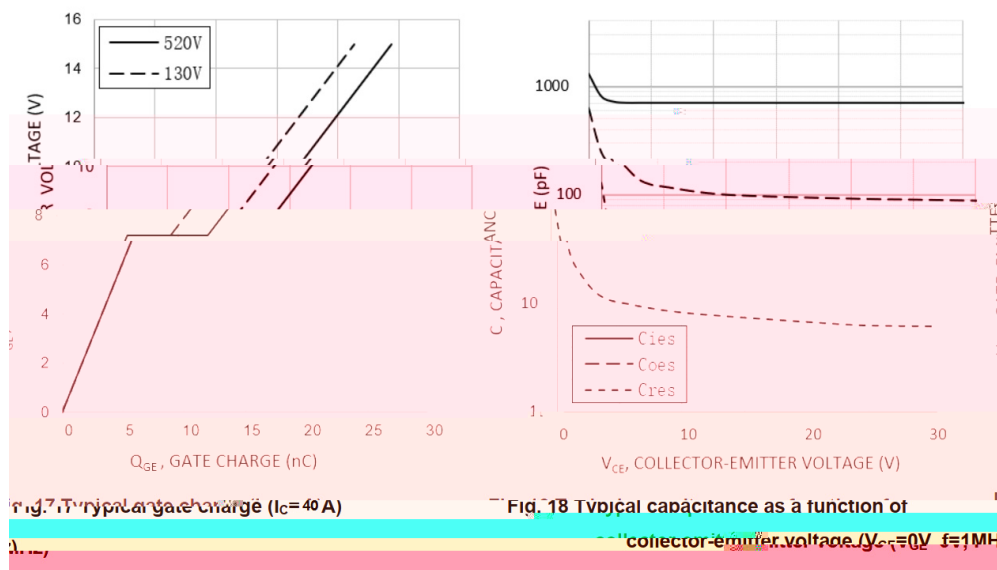
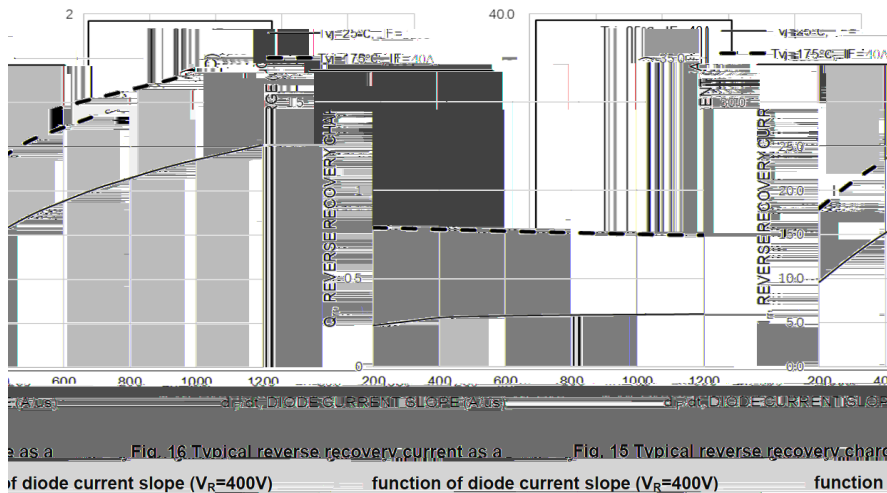
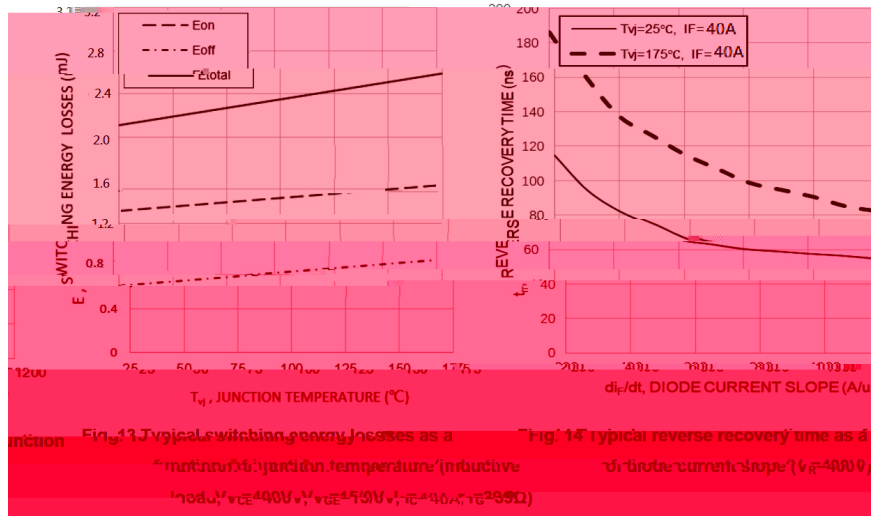
/ Electrical Characteristic Curve



/ Electrical Characteristic Curve



/ Electrical Characteristic Curve



/ Electrical Characteristic Curve

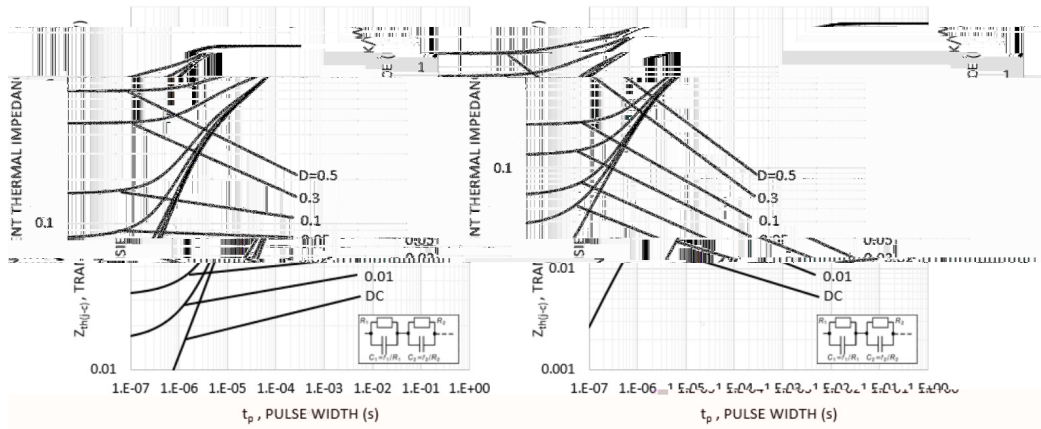
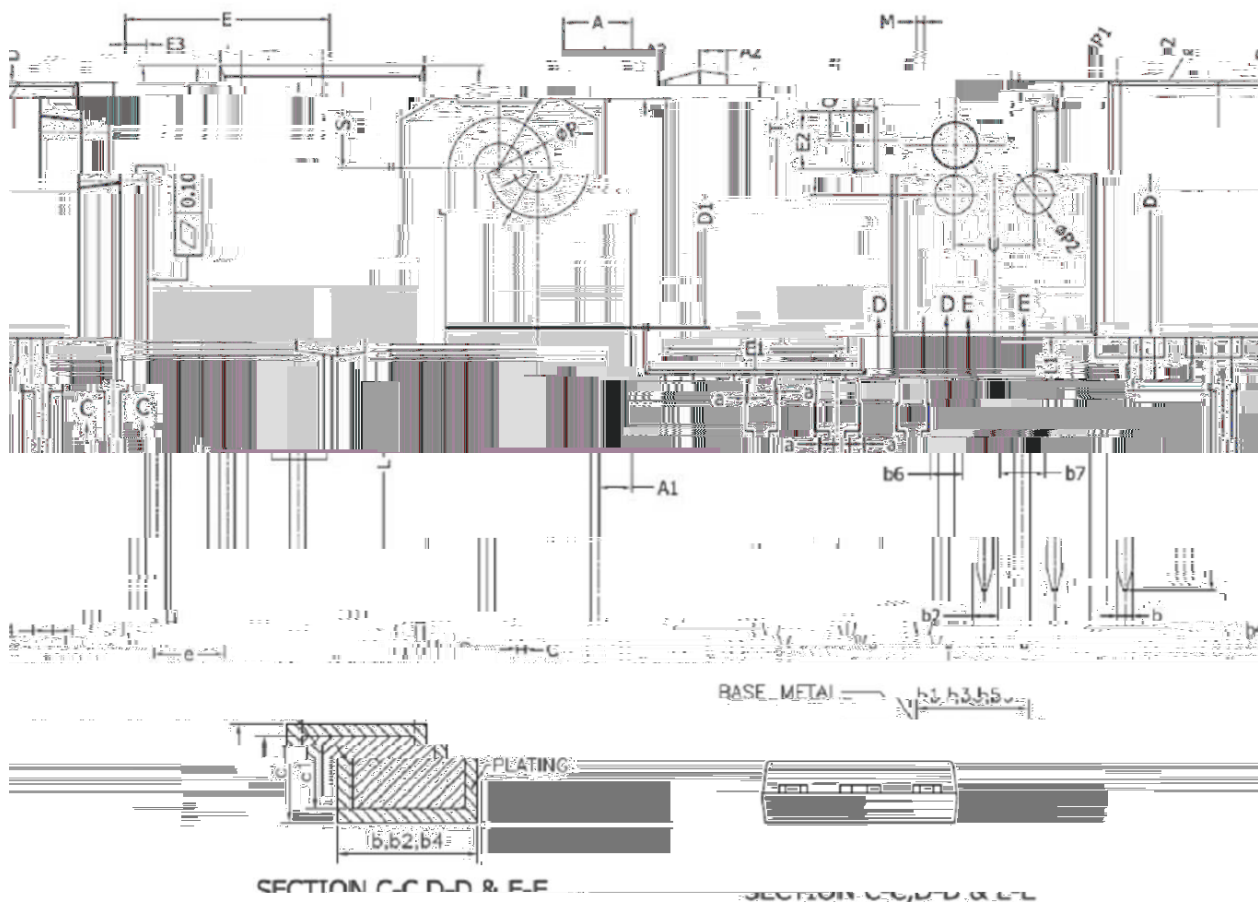


Fig. 19 Diode transient thermal impedance as a function of pulse width ($D=t_p/T$)

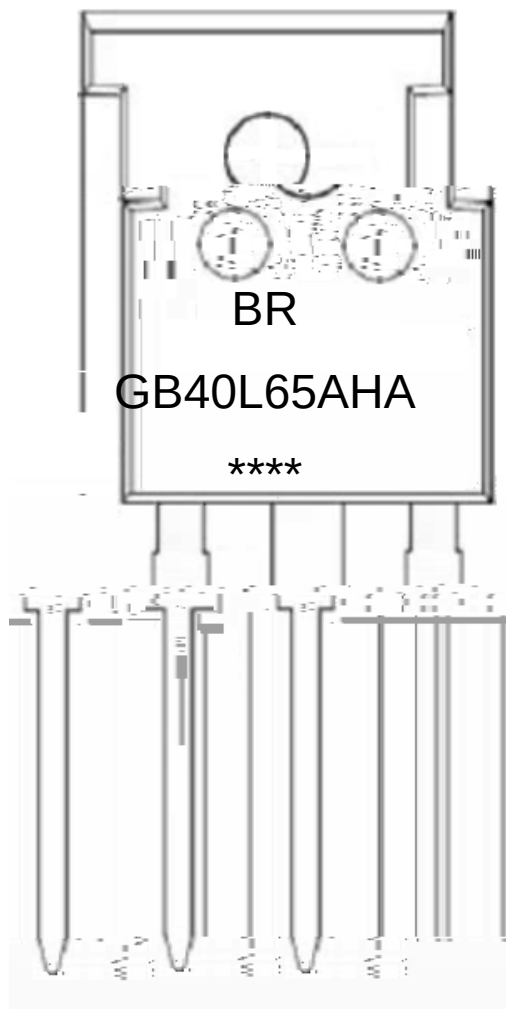
Fig. 20 Diode transient thermal impedance as a function of pulse width ($D=t_p/T$)

/ Package Dimensions



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	4.90	5.00	5.10	E	15.70	15.80	15.90
A1	2.31	2.41	2.51	E1	13.10	13.30	13.50
A2	1.90	2.00	2.10	E2	4.40	4.50	4.60
a	0.00	-	0.15	E3	1.50	1.60	1.70
a'	0.00	-	0.15	e	5.436 BSC		
b	1.16	-	1.26	L	19.80	19.92	20.10
b1	1.15	1.20	1.22	L1	-	-	4.30
b2	1.96	-	2.06	M	0.35	-	0.95
b3	1.95	2.00	2.02	P	3.40	3.50	3.60
b4	2.96	-	3.06	P1	7.00	-	7.40
b5	2.96	3.00	3.02	P2	2.40	2.50	2.60
b6	-	-	2.25	Q	5.60	-	6.00
b7	-	-	3.25	S	6.05	6.15	6.25
c	0.59	-	0.66	T	9.80	-	10.20
c1	0.58	0.60	0.62	U	6.00	-	6.40
D	20.90	21.00	21.10				
D1	16.25	16.55	16.85				
D2	1.05	1.17	1.35				

/ Marking Instructions



BR

GB40L65AHA

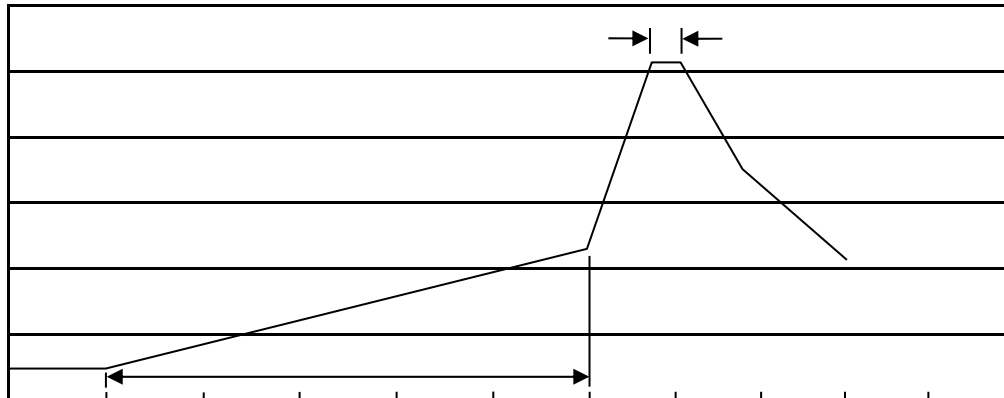
Note:

BR: Company Code

GB40L65AHA: Product Type Code

****: Lot No. Code, code change with Lot No.

() / Temperature Profile for Dip Soldering(Pb-Free)



Note:

- | | | | | | |
|---|-------|-----|-----------|--------|---|
| 1 | 25 | 150 | 60 | 90sec; | 1.Preheating:25~150 , Time:60~90sec. |
| 2 | 255±5 | | 5±0.5sec; | | 2.Peak Temp.:255±5 , Duration:5±0.5sec. |
| 3 | | 2 | 10 | /sec. | 3. Cooling Speed: 2~10 /sec. |

/ Resistance to Soldering Heat Test Conditions

270±5 10±1 sec. Temp.:270±5 Time:10±1 sec

/ Packaging SPEC.

/ TUBE

Package Type	Units					Dimension (unit mm ³)		
	Units/Tube /	Tubes/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Tube	Inner Box	Outer Box
TO-247	30	15	450	5	2250	520×44×6	580×158×55	595×300×178

/ Notices

All information provided in this document is subject to legal disclaimers.